A satellite image of Hurricane Isabel, showing a well-defined eye and a dense, swirling cloud structure. The hurricane is moving across the ocean, with the Earth's horizon visible at the top of the frame. The colors are in shades of blue and white, representing the ocean and the clouds respectively.

NESDIS MISSION

To provide and ensure timely access to global environmental data and information services from satellites and other sources to promote, protect, and enhance the Nation's economy, security, environment, and quality of life.

NESDIS VISION

To be the source for the world's most comprehensive and easily accessible satellite products, environmental information, and assessments of the environment.

Imagery shows Hurricane Isabel moving toward the East Coast of North America. GOES-12 1 kilometer, visible imagery.

A Letter From The Assistant Administrator...

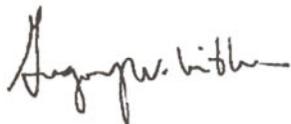
Our accomplishments for 2003 were possible thanks to our employees at the National Environmental Satellite, Data, and Information Service (NESDIS), also known as “NOAA Satellites and Information Service.” The results of our employees’ dedication and reliability were manifested in very tangible ways each day this year, as we constantly took the pulse of planet Earth. NOAA’s satellites monitored Hurricane Isabel, which became a category 5 hurricane on September 11. Isabel later hit North Carolina’s Outer Banks. Imagery from NOAA’s satellites provided critical lead time to local emergency responders and populations in their evacuation efforts, potentially saving many lives. To maintain our 24/7 mission, our operations staff remained on the job away from their loved ones as our facilities, neighborhoods, and surrounding areas bore the brunt of the storm.

This year, NESDIS supported Iraqi Freedom by providing imagery and environmental data. In October, destructive wildfires ravaged parts of California. Imagery from NOAA’s satellites helped fire weather forecasters make accurate predictions concerning the likely spread of the fires, giving residents time to plan for evacuation, potentially saving lives and property.

Each month, NESDIS’ National Climatic Data Center analyzed temperature and precipitation data and produced state-of-the-climate reports. These reports were widely used by public and private sector decision-makers to better understand the relationship between climate and business-related activities.

In the past year, we assumed key leadership in several international efforts. As part of the NOAA team, NESDIS helped organize the first ministerial level Earth Observation Summit, held in Washington, D.C., in July. Over 30 countries and 20 international organizations participated and worked toward establishing a new comprehensive, coordinated, and sustained international Earth observing system. This new observing system concept will provide critical environmental data resulting in benefits in areas such as weather, climates, oceans, agriculture, environmental disasters, health, and energy. Also, on behalf of the United States, I served as chair of the international Committee on Earth Observation Satellites and co-chair of the Integrated Global Observing Strategy during the year.

The accomplishments documented in this report serve our Nation and the global community by providing comprehensive and easily accessible satellite products, environmental information, and assessments of the environment. I am proud of all NESDIS employees, and I applaud their unsurpassed accomplishments for 2003.



Gregory W. Withee
Assistant Administrator for Satellite and Information Services



Introduction



The National Oceanic and Atmospheric Administration (NOAA) mission is to understand and predict changes in the Earth's environment and conserve and manage coastal and marine resources to meet our Nation's economic, social, and environmental needs. NESDIS supports this mission with a focus on NOAA's four mission goals:



Goal 1:

Protect, restore, and manage the use of coastal and ocean resources through ecosystem-based management



Goal 2:

Understand climate variability and change to enhance society's ability to plan and respond



Goal 3:

Serve society's needs for weather and water information



Goal 4:

Support the Nation's commerce with information for safe, efficient, and environmentally sound transportation

This annual report highlights key achievements in 2003 that have resulted in numerous benefits to the Nation. NESDIS provides global environmental data from satellites and other sources to NOAA and other Federal agencies, the Nation as a whole, and international partners. These data are used to provide severe storm warnings, short- and long-term weather forecasts, climate analyses, satellite-aided search and rescue, and other services. NESDIS contributes to the national economy with data that support resource management in areas such as energy, water, transportation, and global food supplies.

This report, organized according to NOAA's four mission goals, highlights our accomplishments that support these goals. It also provides an update on the following NOAA cross-cutting priorities: international cooperation and collaboration; environmental literacy, outreach, and education; state-of-the-art research; and organizational excellence. The document also features employee awards for 2003.



Goal 1:

Protect, restore, and manage the use of coastal and ocean resources through ecosystem-based management

Coastal areas are among the most developed in the Nation, with over half of the population living in less than one-fifth of the land. Coastal counties are growing three times faster than counties elsewhere, adding 3,600 people a day to their populations. Coastal and marine waters support over 28 million jobs, generate over \$54 billion in goods and services a year, and provide tourism for 180 million Americans per year. The commercial fishing industry contributes over \$28 billion annually to the national economy, and about 18 million Americans engage in recreational fishing each year. Within this context, NOAA works with its partners to achieve a balance between the use and protection of these resources. NESDIS provides data and information that are used to restore and protect ocean, coastal, and Great Lakes resources. NESDIS is continuing to improve the accuracy of forecasts of significant ecological events.

Satellite Data Used to Monitor Heat Stresses on Coral Reefs

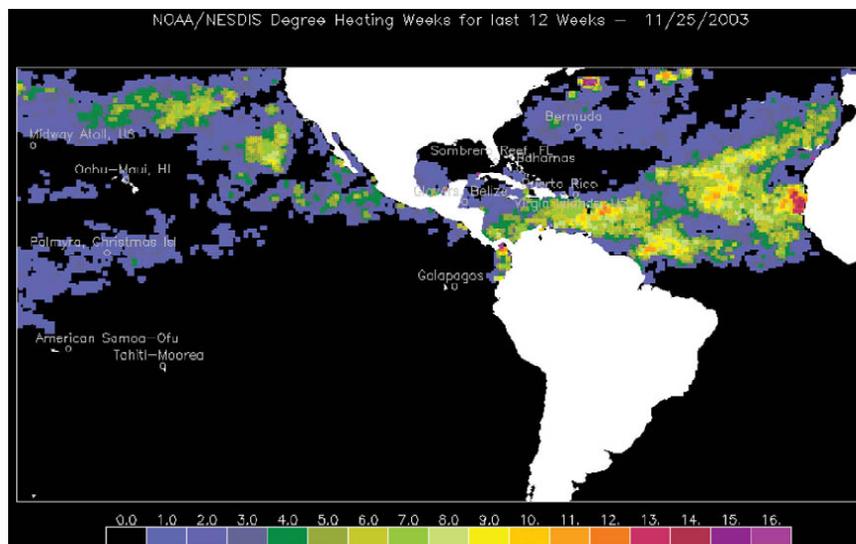
NOAA scientists are using satellite data to monitor the long-term effects of heat stresses on several coral reefs throughout the world. In February, NESDIS began providing an operational product called “Degree Heating Week (DHW) Charts.” Developed from satellite-derived information, DHW charts are produced weekly so that scientists and reef managers can monitor the cumulative thermal stress of several coral reefs, including Australia’s Great Barrier Reef, the Galapagos, and the Bahamas. The extent and acuteness of thermal stress, key predictors of coral bleaching, contribute to coral reef degradation worldwide.

Coral reefs compose a large and integral part of the coastal ocean, supporting a variety of sea life and providing resources of significant economic importance. Coral bleaching occurs as coral tissue expels zooxanthellae, a symbiotic algae essential to coral survival that resides within the structure of the coral. Bleaching is induced by high water temperatures.

These charts have enabled coral reef managers and stakeholders to have up-to-date, accurate, and reliable information on the status of their reefs. For sites having high ratings, the managers may be able to take active measures to prevent further damage to the reefs.

Along with the operational product, NESDIS provides continuous technical support on a 24-hour, 7-day basis, and maintains a Web site that is updated twice a week.

Please visit: http://www.osdpd.noaa.gov/PSB/EPS/SST/dhw_retro.html for more information.



Degree Heating Week charts like this one are being used by coral reef managers to determine the amount of accumulated thermal stress that can result in coral bleaching.



The HABSOS Web site is a data and information portal to harmful algal blooms.

Mexico Joins Harmful Algal Blooms Observing System

The increasing frequency and negative economic impact of harmful algal blooms (HAB) on coastal communities have spurred interest in the development of a timely and effective monitoring and forecasting system.

Addressing this issue in the Gulf of Mexico is the Harmful Algal Blooms Observing System (HABSOS), a collaborative project of the NESDIS' National Coastal Data Development Center, U.S. Environmental Protection Agency and over 30 other Federal, state, academic and industry organizations. Most recently, the Mexican Gulf states have joined HABSOS, resulting in a true international collaboration to monitor HAB dynamics.

The purpose of HABSOS is to provide an Internet-based information and communication system available to state and local coastal resource managers. Early alerts, timely forecasts of harmful algal bloom movement, and predictions of time and location of potential blooms are disseminated using this system. The goal is to better understand the common dynamics and consequences of events, and assist decision-makers with first alerts, event validation, oyster bed and beach closure decisions, and public notification and interaction.

Please visit: <http://www.ncddc.noaa.gov/habsos> for more information.

New Charts Produced for Gulf of Mexico Hypoxia Watch

The Gulf of Mexico hypoxia watch is a cooperative project of NESDIS' National Coastal Data Development Center, the National Marine Fisheries Service (NOAA Fisheries), the CoastWatch Central Office, and the CoastWatch Gulf of Mexico Regional Node.

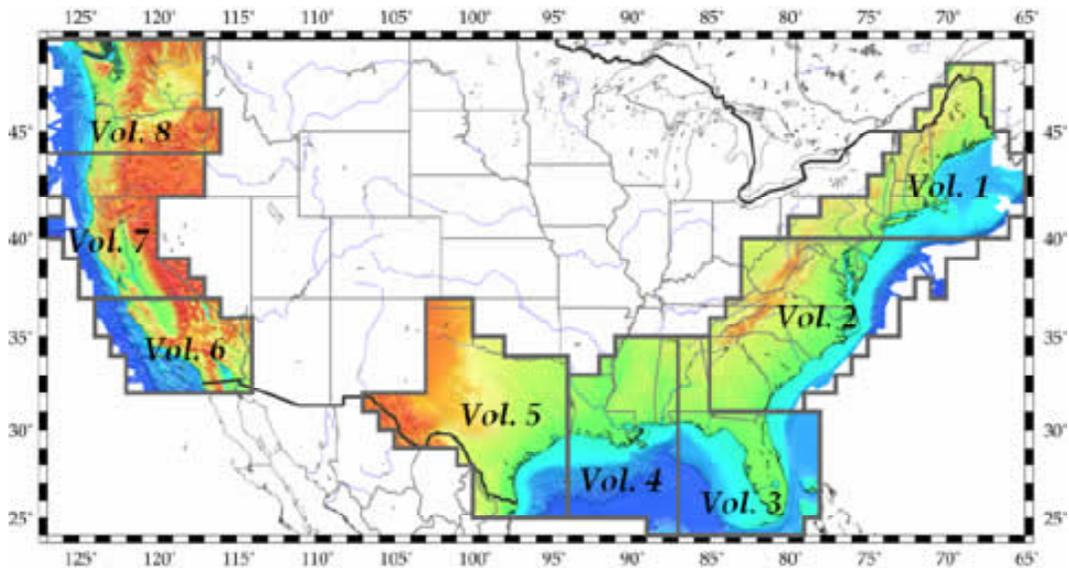
NOAA's CoastWatch program makes environmental satellite data products and in-situ data available to Federal, state and local marine scientists, coastal resource managers, and the public. The hypoxia watch was part of an annual summer groundfish survey conducted by NOAA Fisheries aboard the NOAA Ship Oregon II.



Charts such as this one are generated from data provided by NESDIS and other agencies.

As the 2003 survey cruise progressed, contour maps of measurements of bottom dissolved oxygen and other data were rendered in graphic interchange format (gif) images. The maps were generated in near real time, placed online, and refreshed every few days. About 200 locations were sampled in June and July. The measurements formed the basis for summertime advisories on anoxic and hypoxic conditions in the north-central Gulf of Mexico. The data are used to help scientists understand the effects of hypoxia on various groundfish.

Please visit: <http://www.mslabs.noaa.gov/cwatch/> and <http://coastwatch.noaa.gov/GOMxhypoxia> for more information.



The Coastal Relief Model CD-ROM database provides the first comprehensive view of the U.S. Coastal Zone.

National Geophysical Data Center Produces Coastal Relief Model CD-ROMs

NESDIS' National Geophysical Data Center (NGDC) is addressing the need for topographic-bathymetric relief models that integrate land and seafloor elevations. NGDC's Coastal Relief Model provides the first comprehensive view of the U.S. Coastal Zone. In many cases, this seaward limit reaches out to, and in places beyond, the continental slope. The result is a never-before-seen detailed view across the U.S. coastal zone.

The database, which contains data for the entire coastal zone of the contiguous United States, is available on CD-ROM. The next data sets to be released will be of Hawaii and Puerto Rico, to be followed by Alaska and the Aleutian Islands. The database will eventually include the Great Lakes and surrounding state coastal areas.

Please visit: <http://www.ngdc.noaa.gov/mgg/coastal/coastal.html> for more information.

First Cooperative Institute for Satellite Oceanography Established

In 2003, the Nation's first Cooperative Institute for Oceanographic Satellite Studies was established at Oregon State University, with the award of a \$4.5 million grant from NOAA. The 5-year grant established a partnership between scientists at the university and at NESDIS.

The institute will develop applications using NOAA satellite oceanographic data in ocean and climate research projects, and in numerical environmental prediction models. The institute also plans to develop new satellite oceanographic sensors and applications. The scientists are initially focusing on the California Current System, located within 500 miles of the West Coast. The goal is to make improvements in NOAA satellite data products, which can then be applied to other coastal regions of the United States and the Earth.

University President Tim White said, "This new institute will continue our long partnership with NOAA and bring the power of remote sensing to the study of our Nation's coastal ocean and its links to the deep ocean and atmosphere. We are privileged to work with NOAA as it expands its capabilities in studying our home planet."



Goal 2:

Understand climate variability and change to enhance society's ability to plan and respond

Society exists in a highly variable climate system, with conditions changing over seasons, years, decades, and longer periods. Weather- and climate-sensitive industries, both directly and indirectly, account for about one-third of the Nation's gross domestic product, or about \$3 trillion. To enable society to better respond to changing climate conditions, NOAA, working with national and international partners, will employ systems to accelerate a structure and process for improving the relevance of climate science to assist decision-makers in developing responses to variability and changes in the climate. NESDIS ensures data stewardship to provide researchers, policy makers, and the public with critical data. NESDIS also contributes data and information on climate variability and change, and their effect on commerce.

Climate Center Takes the Pulse of Planet Earth

Each month during 2003, NESDIS' National Climatic Data Center (NCDC) analyzed temperature and precipitation data for the globe, the country, climate regions, states, and local areas throughout the United States. The analyses were summarized in reports that placed each month, season, and the year-to-date into historical perspective.

NCDC reported that winter 2002-03 was a season of stark contrasts in the United States, with colder-than-normal temperatures and periods of heavy snowfall in the East, while unusual warmth and persistent drought covered most of the West. Parts of the East Coast, including Virginia, North Carolina, and South Carolina, experienced their wettest spring on record. Texas experienced its second driest spring in the 109-year record.

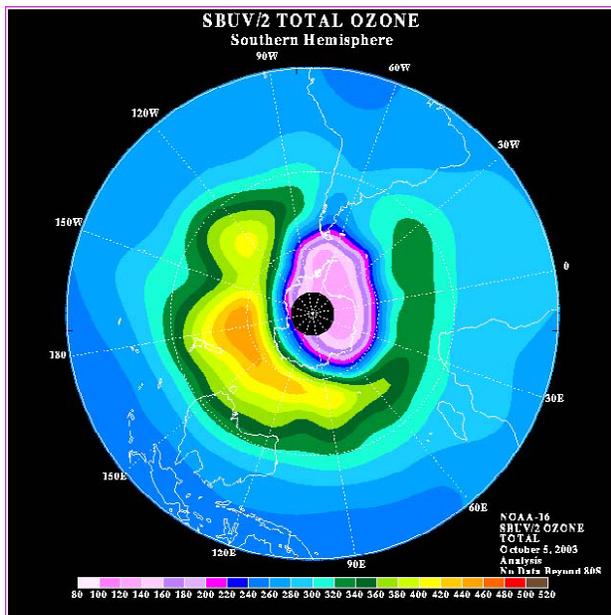
Summer 2003 temperature and rainfall fluctuated by region. Much of the East was wetter and cooler than average, while most of the West experienced near-record high temperatures. Less-than-average rainfall in parts of the West led to worsening drought conditions. As El Niño ended in March and then showed signs of returning in late 2003, global surface temperatures remained much warmer than average. Global surface temperatures were the second warmest for the June through August time period, and the second warmest for August. Preliminary data indicated new record warm monthly global surface temperatures in September and October.

Please visit <http://www.ncdc.noaa.gov/oa/climate/research/monitoring.html> for more information.

2003 Ozone Hole Second Largest on Record

NOAA's polar-orbiting satellites played a major role in monitoring this year's Antarctic ozone hole. On September 11, 2003, the size of the hole reached 10.9 million square miles, the second largest hole on record. For comparison, the largest hole recorded, on September 10, 2000, covered 11.5 million square miles, while in 2002, the ozone hole covered 8.1 million square miles.

Total column ozone estimates from the Solar Backscatter Ultraviolet (SBUV/2) instruments on NOAA-16, and -17 satellites and from the High Resolution Infrared Sounders on NOAA-15, -16 and -17 satellites support these measurements. The NOAA-16 SBUV/2 estimates of the ozone hole area set a new record for August, and are second only to the area in 2000 for September.



Data from NOAA-16 show that in 2003 the Antarctic ozone hole was the second largest ever observed.

The size of the ozone hole decreased dramatically in early October—much like it did in 2000. In November, the hole was well below the past 10-year average and was steadily decreasing.

This year, the Antarctic polar vortex was cold and stable, similar to its condition in 2000 and 2001, and in contrast to last year’s vortex with its very unusual wave activity. Both instrument systems on NOAA’s satellites reported minimum values for the first two weeks in October. These low values indicate that almost all of the Antarctic ozone in the lower stratosphere, where most of the ozone usually resides, had been destroyed. A complete retrospective appraisal of this year’s ozone hole was published in NOAA’s *Southern Hemisphere Winter Summary* in December.

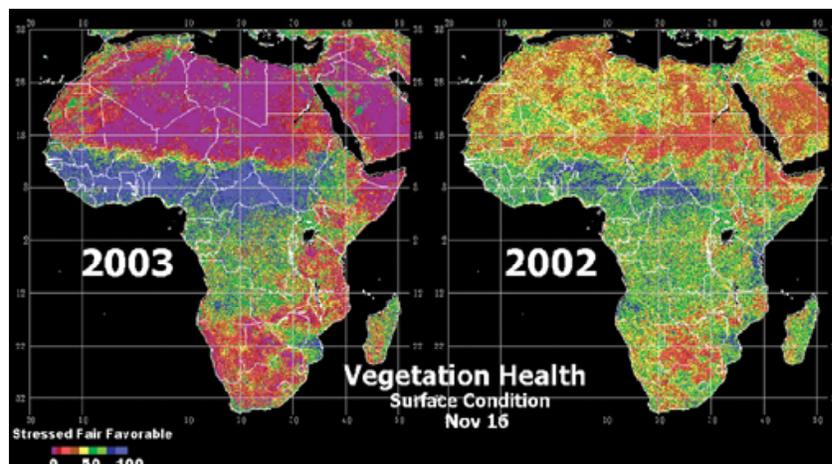
Please visit: <http://www.ozonelayer.noaa.gov/index.htm> and http://www.cpc.ncep.noaa.gov/products/stratosphere/STRAT_OZONE.html for more information.

Drought Monitored in Horn of Africa

NOAA’s Polar-orbiting Operational Environmental Satellites (POES) played a key role in detecting dangerous drought conditions in Africa in 2003. Satellite data pinpointed drought conditions in parts of Kenya, Ethiopia and Somalia. The satellite data enabled NESDIS to give humanitarian and relief officials advanced notice to make decisions that helped save lives. NOAA’s ability to use data from its environmental satellites to detect these conditions is an example of the benefits derived from a global observing system.

The critical satellite instrument for vegetation monitoring is the Advanced Very High Resolution Radiometer (AVHRR), which measures the amount of solar reflection from green vegetation based on chlorophyll content. NESDIS scientists combine the visible, near infrared and infrared measurements to develop several indices to calculate moisture, thermal conditions, and the overall health of the vegetation.

Please visit: <http://orbit-net.nesdis.noaa.gov/crad/sat/surf/vci/index.html> for more information.



Satellite data from NOAA’s Polar-orbiting Operational Environmental Satellites are used to compare vegetation health surface conditions for November 2003, and November 2002.



Scientists measure the circumference and diameter of the largest hailstone ever recorded in the United States.

The Largest Hailstone in the United States Verified

On June 22, a raging thunderstorm that pounded south-central Nebraska produced the largest hailstone ever recovered in the United States. The hailstone, having a seven-inch diameter and a circumference of 18.75 inches, fell in Aurora, Nebraska. The NOAA National Climate Extremes Committee, responsible for validating national records, formally accepted the measurements from the National Weather Service Hastings, Nebraska, forecast office in July. The committee included a team of experts from the NESDIS' National Climatic Data Center in Asheville, North Carolina, and the National Weather Service. A group of local residents found the hailstone and kept it from melting.

The previous record-setting hailstone had a diameter of 5.7 inches and a circumference of 17.5 inches; it was found in Coffeyville, Kansas, on September 3, 1970. An accurate weight of the Aurora hailstone could not be measured, so the Coffeyville, Kansas, stone retained the record as the heaviest hailstone at 1.67 pounds.

Please visit: <http://www.ncdc.noaa.gov/oa/climate/severeweather/extremes.html> for more information.

Climate TimeLine Web Site Makes Debut

In a collaborative effort, researchers at NOAA and the Cooperative Institute for Research in Environmental Sciences, Boulder, Colorado, developed a new online tool to help explain how weather and climate variability at different time scales is studied, and to focus on the human dimension to global climate change, past, present and future.

The Climate TimeLine Web site provides background information and resources to help teachers, students and general audiences better understand climate science. The Web site, designed as a one-stop source for climatic characterizations and resources, offers a range of features including: a tutorial; a glossary of weather, climate, time-scale and evolutionary terms; an overview of variations in the climate system, ranging from billion year to one-hour time scales; a data access interface; an extensive bibliography; and a quiz for users to test their knowledge.

The Web site has received the SciLinks award from the National Science Teachers Association, and the Eisenhower National Clearinghouse Digital Dozen for excellence in science education. Under Secretary of Commerce for Oceans and Atmosphere Vice Admiral Conrad Lautenbacher has indicated that the Climate TimeLine is "an excellent learning tool that provides in-depth information on our climate." One citizen wrote: "I was helping my daughter do a climate project, and I found and used your site. I not only wanted to thank you for the information, but I also wanted to praise the setup and ease of navigation of your site. Nicely done."

Please visit: <http://www.ngdc.noaa.gov/paleo/ctl/> for more information.



The Climate TimeLine Web site is a one-stop source for climate resources.



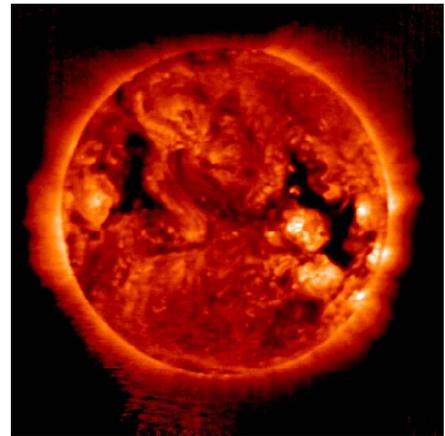
Goal 3:

Serve society's needs for weather and water information

Hurricanes, tornadoes, tsunamis, and other severe weather events cause \$11 billion in damages each year. Weather, including space weather, is directly linked to public safety. About one-third of the U.S. economy, or \$3 trillion, is weather-sensitive. With so much at stake, NOAA's role in observing, forecasting, and warning of environmental events is expanding. Data users are becoming increasingly more sophisticated at using NOAA's weather and water information to improve management of environmental resources and quality of life. NESDIS is deploying new multi-use observing systems and implementing more research findings into NOAA operations with less transition time. NESDIS is providing real-time and near real-time data to assist forecasters and water managers.

GOES-12 Activated

On April 1, 2003, GOES-12, the Nation's newest and most advanced geostationary operational environmental satellite, was activated from an on-orbit storage mode, replacing the older GOES-8, which served the East Coast and Atlantic Ocean for almost 10 years. GOES-12 is the first satellite to have an advanced solar storm detector, the Solar X-ray Imager (SXI), onboard. The SXI completed successful testing in January 2003 and was later placed online. The SXI provides space weather forecasters with real-time images of the sun's atmosphere. This information helps pinpoint when solar activity could harm assets on land and in space.



This view of the sun was taken by the GOES-12 Solar X-ray Imager on January 30 at 11:53 a.m. EST.

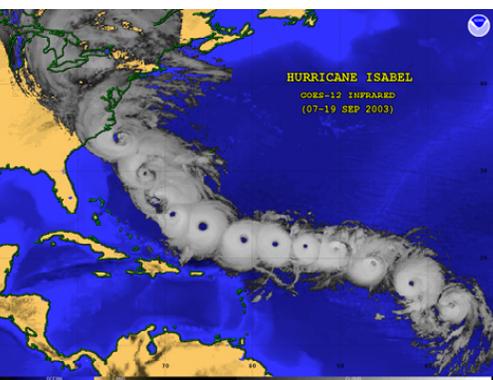
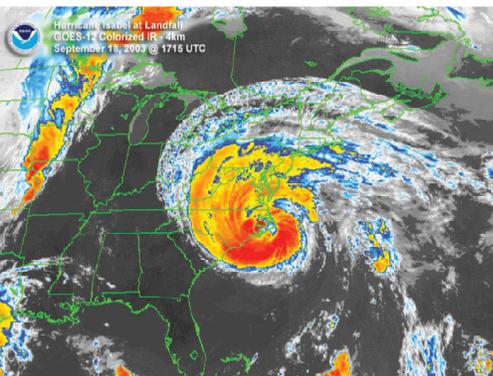
“With the information provided by the SXI, we're working to better integrate space weather into environmental situational awareness,” said Brigadier General David L. Johnson, Air Force Director of Weather.

“The SXI will detect and provide positions for 70 percent more solar flares than current ground observations,” said Ernest Hilder, director of the NOAA Space Environment Center in Boulder, Colorado. “By knowing flare longitude, a forecast can be made that would be accurate for a window of about 12 hours. Without the solar longitude of a flare, the time of maximum particle radiation cannot be accurately predicted and can vary over a range of 100 hours.”

In August, space weather forecasters at the Space Environment Center used data from the SXI to detect a strong geomagnetic storm that rated a G4, the second highest rating on the NOAA space weather scales. These storms are disturbances in the geomagnetic field caused by gusts in the solar wind that blows by Earth. A G4 geomagnetic storm can affect power systems with possible widespread voltage control problems, and some protective systems will mistakenly trip out key assets from the grid.

On November 6, space weather forecasters reported that a coronal mass ejection associated with a huge X-28 flare that had occurred 2 days previously reached the Earth's magnetic field. Detected by the SXI, it was the largest flare recorded by NOAA since records began in 1976. The flare kicked off a minor geomagnetic storm.

Please visit: <http://www.sec.noaa.gov/sxi/index.html> for more information.



Top: This infrared satellite image from GOES-12 shows Isabel hitting the East Coast on September 18th. Bottom: A montage of Hurricane Isabel was created with infrared images from GOES-12 at 11:45 UTC for 13 days. (NOAA/U. of Wisc./SEC)

Satellites Monitor Hurricanes and Other Severe Storms in 2003

Through the middle of November, NOAA satellites had monitored 14 named storms and five tropical depressions over the Atlantic, and 16 named storms over the Eastern Pacific during 2003. Satellite data allow forecasters to better pinpoint the location and motion of a hurricane, with early warnings that save lives and property.

On September 6, a tropical wave moving off the shore of Africa developed into Tropical Storm Isabel in the far eastern Atlantic, near the Cape Verde Islands. The next day, as it moved west-northwestward, Isabel developed an eye and reached hurricane strength. Conditions were very favorable for Isabel's continued development with warm sea surface temperatures ahead of it, low shear and an impressive outflow pattern from the storm. Intensification continued over the next several days and Isabel became a category 5 hurricane on September 11. Isabel weakened by the 15th/16th; it decreased in strength to a category 2 storm, and made landfall along North Carolina's Outer Banks on September 18 with sustained winds of approximately 85 knots — a minimal category 2 storm.

Compared with some hurricanes of the recent past, rainfall totals were relatively low in Virginia and the Carolinas, and flooding was not as severe as feared possible. Hurricane force winds and a storm surge of as much as 7-10 feet from Cape Hatteras and into the Chesapeake Bay area led to widespread damage at Cape Hatteras and flooding in coastal Virginia and Maryland. While most flooding occurred at the coastal margin, the combination of strong winds and

wet soils also led to widespread damage and power outages from falling trees in Virginia and other parts of the mid-Atlantic.

In the Eastern North Pacific, the season began slowly, though 16 named storms had developed as of the end of October. None of the storms reached hurricane strength until Ignacio in late August. By October 31, seven storms had reached hurricane strength. In October, three tropical storms formed in the Eastern Pacific, all of which reached hurricane strength. Hurricanes Olaf and Nora came ashore in Mexico, while short-lived Patricia did not make landfall.

Hurricane Ignacio developed off the West Coast of Mexico on August 21, and became a hurricane by the 24th as it entered the Gulf of California. Ignacio made landfall along Mexico's Baja Peninsula on the 26th, along with very heavy rainfall and maximum sustained winds near 75 miles per hour. The storm battered the city of La Paz for more than 48 hours with strong winds and flooding rains. By August 27, Ignacio had weakened into a tropical depression as it tracked over the central Baja Peninsula.

Please visit: <http://www.ncdc.noaa.gov/oa/climate/research/2003/fl-hu-is-comp.html> for more information.

Imagery Team Monitors Tropical Storms, Fires, Floods, Dust Storms, and Other Significant Events

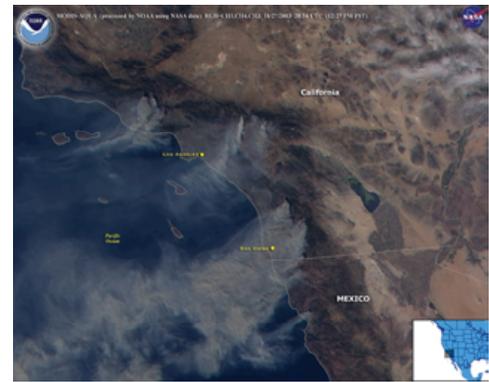
NESDIS' Operational Significant Event Imagery team provides daily online reports containing high-resolution, detailed imagery of significant environmental events visible in satellite data. Using a number of satellite sources, the team reports on events such as fires, floods, dust storms, severe weather, ocean events, volcanic activity, and

other events. The team occasionally creates special coverage Web pages that follow particularly significant events. Imagery of hurricanes and of destructive wildfires in California was published by numerous media outlets, including wire services, major television network news programs, and Internet news services.

During 2003, the team provided special coverage of Iraq, in support of the U.S. government. The coverage included smoke and hot spots from oil fields and other fires in Iraq; dust storms in Iraq and Kuwait; airplane contrails; and other imagery.

In addition, satellite imagery of events around the world was provided during the year. These events included fires in Tanzania, China, Mozambique, Paraguay, Argentina, and the United States. During the year, imagery of significant flooding in India, Indonesia, and Zambia was also provided.

Please visit: <http://www.osei.noaa.gov/> for more information.



Thick smoke (gray) is visible from fires burning in California in this MODIS (Moderate Resolution Imaging Spectroradiometer) image from NASA's Aqua satellite. The image was processed by NESDIS.

Key Milestones Reached in Geostationary Operational Environmental Satellite (GOES) Program

Data from NOAA's GOES satellites provide short-term advance weather warning products to the private and public sectors to protect lives, property, and the environment. The future GOES-R mission, planned for launch in 2012, is expected to improve the quality and timeliness of forecasts, to further improve public safety and economic security.

NESDIS has a vital partnership with industry in this program, and continues to conduct extensive user outreach. The user community is helping NOAA fine-tune GOES requirements, products, communications, and distribution of data. During the year, NESDIS continued its dialog with GOES users to prepare to acquire, apply, and distribute data from GOES-R.



Imager and sounder set aside testing recently completed for GOES-O with ITT supplied integration sphere (zero to 100% albedo light source) used for visible channel calibrations.

In October, NOAA awarded 12 contracts, totaling \$20.5 million, for advanced architecture studies for the GOES-R program. Each contract has a 12-month term, with a potential option of 6 extra months. Through these contracts, NOAA plans to acquire research and technologically advanced information about end-to-end system alternatives from commercial specialists in the aeronautical, communications, and data management fields. NOAA will take these results and explore potential systems architectures for GOES-R. The contract awards are the result of combined efforts of NOAA, the National Aeronautics and Space Administration (NASA), and independent consultants.

Defense Meteorological Satellite Program (DMSP) F-16 Successfully Launched

NESDIS operates satellites in the DMSP program. NOAA assumed responsibility for operation of the DMSP spacecraft as part of the convergence of the military and civilian environmental satellite programs. DMSP satellites are operated from the Satellite Operations Control Center in Suitland, Maryland. The data are archived at the National Geophysical Data Center in Boulder, Colorado.



Credit: Patrick H. Corkery, Lockheed Martin Space Systems

DMSF F-16 lifts off from Vandenberg Air Force Base, California, aboard a Titan II.

DMSF F-16 was successfully launched from Vandenberg Air Force Base, California, on October 18. The spacecraft received a smooth ride from the last of the Titan II boosters and then underwent 14 days of early-orbit checkout. After 30 days, the primary sensors were calibrated and the satellite became operational with control transferred to NOAA.

On October 20, NESDIS' National Geophysical Data Center (NGDC) received its first shipment of raw data records from the Air Force Weather Agency, including data from all seven instruments, and data on the health of each instrument. Data from F-16 and subsequent DMSF satellites will have a significant impact on NGDC's archive and scientific data operations.

National Polar-orbiting Operational Environmental Satellite System (NPOESS) Critical Design Reviews Successful

Representatives of the government, contractors, and independent evaluators met in August for a Critical Design Review of the Cross-track Infrared Sounder that will fly on the NPOESS satellites. The assessment was outstanding, meeting the classic definition of production readiness with plans, drawings, and procedures in place and ready to begin production.

In March, a Critical Design Review of the Ozone Mapping and Profiler Suite was successfully completed. Engineering development units of the two parts of the instrument provided test results; initial checkout of the algorithms showed that the sensor works as planned.

Risk Reduction Satellite Windsat/Coriolis Successfully Launched

The Windsat/Coriolis spacecraft was launched from Vandenberg Air Force Base, California, on January 6, with the Windsat polarimetric microwave radiometer onboard. This instrument is demonstrating the viability of using polarimetry to measure the wind vector from space and provide important meteorological information on wind speed and direction at or near the surface of the ocean. The launch of the radiometer is an important step in reducing risks associated with such instruments as payloads on the National Polar-orbiting Operational Environmental Satellite System (NPOESS). The risk reduction data will be used in the development of the Conical Microwave Imager Sounder, to be flown on NPOESS, to be launched in 2009.

Solar Radiation and Climate Experiment Launched

The Solar Radiation and Climate Experiment (SORCE) was successfully launched via a Pegasus rocket dropped from an L-1011 aircraft on January 25 from Kennedy Space Center/Cape Canaveral Air Force Station, Florida. SORCE has four instruments that will study and measure solar irradiance as a source of energy in the Earth's atmosphere. Two of these, the Total Irradiance Monitor and Spectral Irradiance Monitor, make up NPOESS' Total Solar Irradiance Monitor instrument suite. Their inclusion on SORCE is part of NPOESS risk reduction activities.

Please visit: <http://lasp.colorado.edu/sorce/> for more information.



Goal 4:

Support the Nation's commerce with information for safe, efficient, and environmentally sound transportation

Safe and efficient transportation systems are crucial economic lifelines for the Nation. NOAA's information products and services are essential to the safe and efficient transport of people and goods in the air, on the land, at sea, and on the waterways. Waterborne cargo alone contributes more than \$740 billion to the U.S. gross domestic product and creates employment for over 13 million people. Each year, 134 million passengers are ferried across U.S. waterways, along with 5 million cruise ship passengers. Improved aviation weather information could significantly reduce the \$4 billion that is lost as a result of weather-related air traffic delays. NESDIS data are used to determine the safety of airline routes and flight plans. In the marine industry, NESDIS data reduce the risk of damage to ships and cargo. For surface transportation, NESDIS data are used to issue weather forecasts and warnings. NESDIS also operates the Search and Rescue Satellite-aided Tracking system.

Cospas-Sarsat System Has Banner Year

The year was a busy one for the international Cospas-Sarsat program, which uses NOAA satellites and Russian satellites to detect and locate emergency signals from beacons carried by vessels, aircraft, and outdoor adventurers in distress. At press time, there were 226 rescues in 2003, with 202 people saved on the seas, 4 from downed aircraft in states around the country, and 20 in outdoor activities such as hiking and mountain climbing.

“One of NOAA’s mission goals is to protect lives and property,” said retired Navy Vice Admiral Conrad C. Lautenbacher, Jr., Under Secretary of Commerce for Oceans and Atmosphere. “The Sarsat system is a great example of how we work to achieve that goal every day.” Since the Cospas-Sarsat system became operational in 1982, more than 15,000 lives have been saved worldwide, including 4,500 in the United States.

An important new capability for the program is Personal Locator Beacons (PLBs), carried by outdoor adventurers. These systems had been used in the Alaska wilderness for several years as part of an experimental program. In the United States, PLB alerts are routed to the Air Force Rescue Coordination Center (AFRCC) at Langley Air Force Base, Virginia. “PLBs can pinpoint the location of a person in distress,” said AFRCC Commanding Officer Lieutenant Colonel Scott Morgan. “The bottom line is we’ll be better able to locate individuals and save lives.” The beacons were approved for use throughout the United States in July 2003. To



The Cospas-Sarsat system takes the “search” out of search and rescue as this overview shows.

announce this, NOAA kicked off a nationwide awareness campaign in Washington, D.C., with Boy Scouts from Vermont. In November, the first rescue from this new capability took place in the Adirondack Mountains of upstate New York.

In August, best-selling author and adventure writer Clive Cussler became the official spokesperson for NOAA's PLB outreach program. Cussler is the author of numerous adventure novels featuring the hero Dirk Pitt® and his exploits as part of the fictional National Underwater and Marine Agency.

NOAA's Sarsat program spearheaded a collaborative safety effort with NOAA's Marine and Aviation Operations in 2003 to equip NOAA personnel, particularly those working on small boat operations at various NOAA labs, field offices, and aboard NOAA ships with Personal Emergency Position Indicating Radio Beacons (PEPIRBs). Similar to PLBs, PEPIRBs are designed specifically for the marine environment and are currently available only to Federal agencies in the United States.

NOAA requires that all 406 MHz emergency beacons be registered. To make the registration process faster and easier, NESDIS placed the National Beacon Registration Database online. Emergency beacon owners can now register and update their beacons directly via the Internet at:

<http://www.beaconregistration.noaa.gov>

In 2003, the International Cospas-Sarsat Council approved the use of the system for relaying ship security alerts. This will help protect mariners from acts of terrorism and piracy by having a discrete means to transmit a security alert. Cospas-Sarsat will begin providing this service by July 1, 2004.

Please visit: <http://www.sarsat.noaa.gov> for more information.



There are three types of beacons used to transmit distress signals, EPIRBs (for maritime use), ELTs (for aviation use), and PLBs (used for land-based applications).

Commercial Remote Sensing

Pursuant to the 1992 Land Remote Sensing Policy Act and Administration policy on foreign access to remote sensing space capabilities, since 1993, NOAA has issued 20 operating licenses to 12 companies. Three U.S. firms (DigitalGlobe, Orbimage, and Space Imaging) are now operating four separate satellite systems, providing a variety of valuable data products to government and private sector users.

President Authorizes New National Policy

On April 25, President George W. Bush authorized a new national policy that establishes guidance and implementation actions for commercial sensing space capabilities. The policy offers guidance on: licensing of the remote sensing systems; U.S. Government use of remote sensing capabilities; foreign access to U.S. capabilities and government-to-government intelligence; and defense and foreign policy relationships that involve U.S. commercial remote sensing. Under the policy, NESDIS will continue to license the operations of private remote

sensing systems, in consultation with appropriate Federal agencies. The new policy supersedes Presidential Decision Directive 23, U.S. Policy on Foreign Access to Remote Sensing Space Capabilities, dated March 9, 1994.

NOAA Co-hosts Commercial Remote Sensing Symposium

NOAA, with support from NASA and the U.S. Geological Survey, co-hosted its first Commercial Satellite Remote Sensing Symposium. The symposium's theme was "Improving the International Business Environment." The 3-day event, held in May, was attended by senior executives in industry and government from the United States and abroad. It featured moderated panel sessions on the current market, products and services, U.S. and foreign commercial remote sensing policies and practices, and financing and investment issues. The new national commercial remote sensing policy was announced at the symposium, and was discussed in detail by government and industry officials.

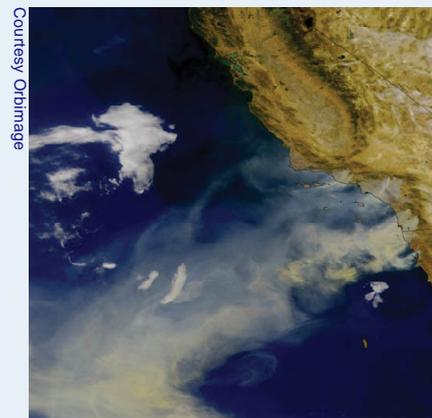


Secretary of Commerce Donald L. Evans (center), Under Secretary of Commerce for Oceans and Atmosphere Vice Admiral (ret.) Conrad C. Lautenbacher, Jr. (right), and NOAA Assistant Administrator Gregory W. Withee are shown at the symposium.

Imagery from Commercial Space Providers Licensed by NOAA



Courtesy Space Imaging



Courtesy Orbimage



Courtesy DigitalGlobe

Top Left: **Space Imaging** provided numerous images of Iraq, including this view of Baghdad taken on April 1. Top Right: **Orbimage** produced this image of the southern California wildfires on October 27 from OrbView -2 indicates that the fires extend farther south than San Diego into Ensenada, Baja California, Mexico. Bottom Left: **DigitalGlobe** produced this image of Three Gorges Dam, China, on July 13.

Cross-cutting Priorities

When NOAA met with stakeholders and employees over the past months to identify strategic directions for the next decade, both groups emphasized that NOAA needs to place higher priority on improving the core capabilities that support the agency's four mission goals. As a result, NOAA selected essential areas of growth for the future. These cross-cutting priorities describe the foundations that enable NOAA to efficiently and effectively operate and deliver services.

International Cooperation and Collaboration

A rapidly shifting political, cultural, and economic world requires Federal agencies involved in world affairs to cultivate fresh approaches and new services to maintain U.S. leadership in these fields. NOAA will support and promote national policies and interests in ecosystem management, climate change, Earth observation, and weather forecasting and will seek to maximize the mutual benefits of international exchange with its global partners. (From "New Priorities for the 21st Century: NOAA's Strategic Plan for FY 2003 – FY 2008 and Beyond.")

Earth Observation Summit Held in Washington

NESDIS was an instrumental part of the NOAA team in organizing the first ministerial level Earth Observation Summit, held at the State Department in Washington, D.C., in July 2003. Over 30 countries and 20 international organizations participated to work toward a common goal—to establish a new international, comprehensive, coordinated and sustained Earth observation system or systems. The new system will be aimed at providing critical scientific data to address important global economic, social and scientific challenges. With this improved knowledge,

decision-makers around the world will be able to make more informed decisions regarding climate, the environment, and a host of other economic and social issues that are affected by Earth and climate systems.

Several U.S. Cabinet officials including Secretary of State Colin Powell, Department of Commerce Secretary Don Evans, and Secretary of Energy Spencer Abraham participated in the program. Joining them, the President's Science Advisor, John Marburger, provided remarks, and the Chairman of the White House Council on Environmental Quality, James Connaughton, presented the policy context on environmental and economic security. NASA Administrator Sean O'Keefe, Interior Secretary Gale Norton, and Acting EPA Administrator Marianne Horinko offered perspectives on the U.S. vision for a comprehensive Earth observation system.

NOAA also organized the inaugural meeting of the follow-on Group on Earth Observations (GEO), held August 1-2. GEO was established to prepare a 10-year implementation plan for a coordinated, comprehensive, and sustained Earth observation system or systems. NOAA Under Secretary Vice Admiral Conrad Lautenbacher is one of four GEO co-chairs.



Secretary of State Colin Powell (left), Secretary of Energy Spencer Abraham (center), and Secretary of Commerce Donald L. Evans spoke at the Earth Observation Summit.

Please visit <http://www.climate-science.gov/Library/observation-summit2003.htm> for more information.



NOAA hosted the 17th Plenary Session for CEOS in November. The plenary group is shown in the photo.

NOAA Chairs Committee on Earth Observation Satellites

NOAA Assistant Administrator Gregory W. Withee chaired the Committee on Earth Observation Satellites (CEOS) during 2003. CEOS is an international organization charged with coordinating international civil space-borne missions designed to observe and study planet Earth. CEOS, comprising 23 space agencies and more than 20 associated national and international organizations, is recognized as the major international forum for the coordination of Earth observation satellite programs and for interaction of these programs with users of satellite data worldwide.

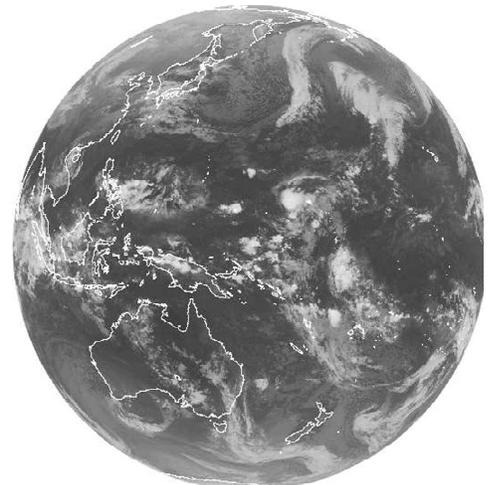
On behalf of the CEOS, NOAA organized a capacity-building workshop as follow-on to the World Summit on Sustainable Development. The workshop was held in Stellenbosch, South Africa, October 2-3, 2003. The goal of this workshop was to examine capacity building needs of African users and opportunities for long-term partnerships – seeking an optimal fit between African needs and CEOS capabilities.

In November 2003, NOAA hosted the 17th Plenary Session for CEOS, a meeting of the Integrated Global Observing Strategy Partnership, and associated events in Colorado Springs, Colorado. A CEOS special event focused on data utilization and capacity-building issues as a follow-on to the World Summit on Sustainable Development.

GOES-9 Operates Over Western Pacific

In April, the United States began operating GOES-9 over the Western Pacific Ocean, per an agreement with Japan signed in 2002. The movement of GOES-9 to its new vantage point is an important step in developing mutual backup meteorological arrangements between the United States and Japan.

Under the agreement, Japan covered the cost of upgrading NOAA's Command and Data Acquisition Station in Fairbanks, Alaska, which enables NESDIS to control GOES satellites over the western Pacific. Japan is also paying to operate GOES-9. The agreement lays the framework for a long-term mutual back-up arrangement, which



This full-disk image from GOES-9 was taken from the satellite's new vantage point, overlooking the Western Pacific Ocean.

would allow the United States to rely on Japan for help if one of the U.S. GOES satellites has problems. GOES-9 backs up Japan's Geostationary Meteorological Satellite-5 (GMS-5), operated by the Japan Meteorological Agency. GMS-5, launched in 1995, is past its useful life and has encountered recent imaging troubles and fuel shortages.

Environmental Literacy, Outreach, and Education

NOAA will apply its broad spectrum of environmental and social science experience to establish an environmental literacy program for educating present and future generations about the changing Earth and its processes. NOAA hopes to inspire our Nation's youth to pursue scientific careers, thereby advancing the future talent of NOAA and its mission partners. This program will improve the public's understanding and response to natural hazards, will assist state and local natural resource managers, and will ensure that decision makers have access to the information they need to appropriately reduce significant human impact on the environment and to respond to storm warning and environmental change.

NESDIS Data Users Workshop: A Forum for Feedback

The NESDIS Data Users Workshop, held in June in Boulder, Colorado, provided a forum for scientists, researchers, managers, and technicians from NESDIS to meet with data users. The workshop was part of a continuing outreach effort for NOAA to better serve our users. Data users from the government, academia, the private sector, and the research community worked together to plan for the future of data and data delivery.

NOAA considers this workshop an important step in a continuing dialog with its constituents. The workshop Web page contains the presentations and lists recommendations from the breakout groups. Over 600 recommendations were received. The three mentioned most frequently are ensuring that user communities have input into decisions affecting them; integrating multiple data sets into a seamless environmental database; and maintaining human customer interface. NESDIS is continuing to work toward achieving these goals.

Please visit: <http://www.osd.noaa.gov/datausers/index.htm> for more information.

The Weather Channel Features Satellite System of the Future

On November 2, The Weather Channel's Forecast Earth program broadcast "Sentinels Against the Storm," a 30-minute program featuring the future National Polar-orbiting Operational Environmental Satellite System. The program also described NOAA's current satellite programs, including the Geostationary Operational Environmental Satellites, Polar-orbiting Operational Environmental Satellites, and the Defense Meteorological Satellite Program. The Weather Channel also plans to include the program in its Weather Classroom endeavors and to promote it in their newsletter to educators.

Sound, State-of-the-art Research

NOAA will support high-quality research underpinning its environmental assessments, prediction, and ecosystem management missions. NOAA will develop and implement the new products, services, and approaches to ecosystem management needed by a Nation facing urgent environmental, economic, and public safety challenges.

Surface Vector Winds Improve Weather Forecasts

NESDIS has played a key role in facilitating access to surface vector winds from NASA's QuikSCAT satellite. Access to these data has allowed NOAA to demonstrate significant improvements to operational forecasting. With its ability to "see" sea surface winds through clouds, the scatterometer aboard QuikSCAT is a valuable tool for hurricane tracking and high seas marine forecasting. QuikSCAT winds are fully integrated into the NOAA warning and forecast decision process for the high seas.

QuikSCAT data can help determine when tropical waves become closed circulations, in effect, contributing to early warnings for hurricanes, and characterizing and tracking hurricanes. During Hurricane Isabel in September, QuikSCAT data were used to help determine the radial extent of the tropical storm force winds.

In March of this year, 50-km winds were being assimilated into NOAA's Global Data Assimilation System. The assimilation of 25-km winds is currently under investigation, as is a new quality control procedure for improving the use of rain contaminated winds. With a target date of June 2004, the Automated Weather Interactive Processing System in each forecast office will be modified to handle QuikSCAT data for improved short-range coastal forecasts and small-craft advisories.

Please visit: <http://manati.wwb.noaa.gov/quikscat/> for more information.

Organizational Excellence: Facilities, Infrastructure, Security, Human Capital, Administrative Services

Improvements in organizational excellence will increase the satisfaction of the customers of NOAA's administrative processes, both inside and outside the Agency; increase employee satisfaction; and improve organizational performance and productivity. (From "New Priorities for the 21st Century: NOAA's Strategic Plan for FY 2003 – FY 2008 and Beyond.")

Groundbreaking Held for New Satellite Facility in Suitland, Maryland

On April 11, NOAA and the General Services Administration broke ground on the site of a new \$61 million Satellite Operations Center in Suitland, Maryland. The new building, expected to open in 2005, will house NOAA's current and future environmental satellite endeavors.

At the ground breaking ceremony, Maryland state officials joined top leaders of NOAA and GSA in heralding the start of construction. Maryland Governor Robert L. Ehrlich said that the new Satellite Operations Center would add to Maryland's



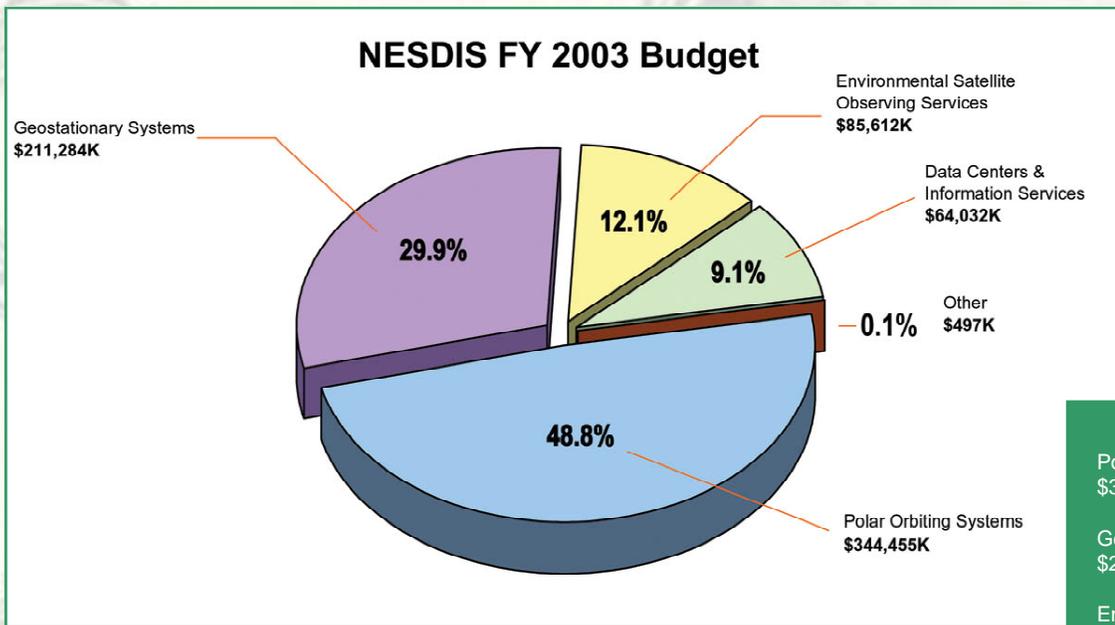
Rear Admiral Thomas Wilson, U.S. Navy (left), Gregory Withee, NOAA Assistant Administrator for Satellite and Information Services (2nd from left), Samuel Bodman, Deputy Secretary of Commerce (4th from left) and NOAA Under Secretary VADM Conrad C. Lautenbacher Jr. (5th from left) are joined by officials from the General Services Administration, and state and local governments at the ground breaking ceremony.

already impressive portfolio as a leader in advanced technology. The new center will expand NOAA's ability to provide the best satellite data available for weather and climate forecasts.

The building will house key computer processing for satellite data to support meteorology, oceanography, and solid earth and solar-terrestrial sciences. The U.S. Mission Control Center for the Search and Rescue Satellite-aided Tracking program, called Cospas-Sarsat, and the National Ice Center will also be located in the new building. The facility will replace NOAA's satellite operations, currently located in the World War II era Federal Office Building 4.

NESDIS FY 2003 Budget

NESDIS has two primary areas of activity: satellite acquisition and services, and data centers and information services. Satellite acquisition and services account for 90.8% of the NESDIS budget. Data centers and information services account for 9.2% of the NESDIS budget.



Polar-orbiting Systems	\$344,455K (48.8%)
Geostationary Systems	\$211,284K (29.9%)
Environmental Satellite Observing Services	\$85,612K (12.1%)
NOAA's Data Centers and Information Services	\$64,032K (9.1%)
Other	\$497K (0.1%)
Total NESDIS	\$705,880K (100%)

A Look to 2004...

Building on accomplishments in FY 2003, work is already underway at NESDIS to meet FY 2004 objectives. In the upcoming year, NESDIS will continue to transition systems and products from research to operational status.

NESDIS plans to move the following products into operations: (1) satellite wind products from the Moderate Resolution Imaging Spectroradiometer (MODIS) to add significant information for forecasters, particularly in coastal environments; (2) aviation hazards algorithms to provide more accurate information for weather warnings, and advisories for pilots; and (3) coral bleaching alerts to coastal managers with information on conditions considered detrimental to the health of coral reefs.

In 2004, NESDIS will take delivery of the ground system for NPP (the National Polar-orbiting Operational Environmental Satellite System Preparatory Project). This is an important step toward meeting our goals for the next generation polar-orbiting environmental satellites. Planning continues for the launch of the NOAA polar-orbiting environmental satellite, NOAA-N. This satellite, the end of the current series of polar-orbiting satellites, leads the way forward to the next generation, the tri-agency NPOESS. These new systems will mean more data coming into our organization for processing and archiving. In addition to space-based data, our national data centers and data processing elements will receive data from in situ platforms. NESDIS, therefore, will strive to place more data available on-line (0.5TB) in 2004. Lastly, NESDIS will develop and place online the Global Tsunami database, to help users understand of the characteristics of these deadly events. In next year's report, we expect to highlight these and other achievements made possible by our dedicated NESDIS staff.



Dr. Colleen N. Hartman
Deputy Assistant Administrator



Administrator's Award Recipients



Diversity SPECTRUM Award Recipients

Administrator's Awards

David Anderson - For his success in promoting the use and visibility of NOAA's pre-instrumental climate information and excellence in NOAA research.

Richard Barazotto - For developing an innovative approach that led to NOAA's full participation in Japan's Advanced Land Observing Satellite program at no cost to NOAA, and with a cost benefit to NOAA of at least \$4,000,000.

Charles Bryant and Paul Pegnato - In recognition of exemplary skill, effectiveness, and extraordinary success in mitigating obstacles and keeping the NOAA Satellite Operations Facility on schedule, resulting in on-time award of the Construction Management Contract and successful receipt of construction bids.

Van D. Crawford - For exceptional performance in the areas of environmental compliance and safety.

Stephen Del Greco and Dr. Tim Crum - For outstanding leadership and innovation in improving the ingest, archive and access of the Weather Surveillance Radar-1988 Doppler data.

Colonel Francis G. Hinnant - For outstanding leadership of the source selection leading to award of the National Polar-orbiting Operational Environmental Satellite System acquisition and operations contract.

Roberta McQuilkin - For sustained and extraordinary contributions to the executive operations of NESDIS.

Linda Williams - For outstanding administrative skills and effectiveness in ensuring the seamless integration of SAO staff into NESDIS and for developing innovative processes to satisfy NOAA CWIP audit requirements.

Charles Wooldridge - For exceptional leadership, skill and tireless efforts in achieving significant improvement in executive office operations, organizational communications and coordination, and support of NESDIS's Senior Executive team.

Margarita Gregg - Nominated for individual award by Offices of the Under Secretary for Oceans and Atmosphere - Organizing U.S. Climate Change Science Program Planning Workshop for Scientists and Stakeholders.

Dane Clark - Nominated for group award by USEC for his work with the new NOAA Strategic Plan

Kurt Schnebele - Nominated for group award by Chief Information Officer for his work in Information Quality Working Groups

February Team Member of the Month

Joe Neunschwander, a senior project engineer with Aerospace Corporation, was cited for his contributions to the Defense Meteorological Satellite Program.

Diversity SPECTRUM Award Recipients

- Nina Jackson**
- Gregory Hammer**
- Timothy Walsh**
- Terry Babb**

Gold Awards (December 2003)
NESDIS received three group Gold Awards.

ORA/OSDPD Group Award for providing weather prediction centers early access to data from an advanced satellite temperature/humidity sensor to improve weather forecasting.

- Mitchell D. Goldberg**
- Eugene D. Legg**

IPO Group Award for leadership in developing innovative systems acquisition and contractor teaming methods to build the next generation of environmental satellites.

- John D. Cunningham**
- Douglas L. Namian**
- James M. Schaeffer**
- Paul L. Wofsy**
- David R. Furlong**

NESDIS and OAR Gold Group Award for advancing the Nation's space weather services through the conception, funding, and Development of the first ever operational Solar X-ray Imager.

- | | |
|-----------------------------|--------------------------------|
| Patricia J. Mulligan | Hal J. Bloom |
| Daniel C. Wilkinson | Peter A. Wilczynski |
| Ronald J. Hooker | Albert B. Spencer, Jr. |
| Richard G. Reynolds | Joseph E. Mulligan |
| Eric G. Chipman | Miguel A. Rosario-Felix |

Silver Medals

NESDIS received two group Silver Awards. Group collaborative effort for successful negotiation of an agreement in an extremely short time frame to provide emergency geostationary satellite back-up for the Japanese Government that also meets the needs of NOAA and the DOD in the Western Pacific.

- | | |
|----------------------------|------------------------------|
| Richard G. Reynolds | Thomas M. Renkevans |
| Charles S. Bryant | John J. Pereira |
| Katy M. Vincent | Robert O. Masters |
| Timothy J. Walsh | Glenn E. Tallia, USEC |
| Eric G. Chipman | |

Hilda Gohrband of the NOAA, CIO — Group Silver Award along with the Office of the Chief Information Officer. The award is for the group's initiative and dedication in developing the e-Learning@NOAA System.

Bronze Awards

Individual Bronze Awards

Linda Pikula – For creating the innovative training program, Ocean Teacher, developed for African maritime nations to expand their capabilities to access global oceanographic observations.

Patrick Caldwell - For excellence in expanding critical sea level observation and data recovery partnerships among non-English speaking nations within the Pacific Rim.

Shobha Kondragunta – For developing a method that for the first time provides accurate satellite retrievals of worldwide atmospheric ozone amounts including polar regions.

Group Bronze Awards

OSO Control and Engineering Branches – For leadership and engineering expertise in the quick recovery of the Defense Meteorological Satellite Program (DMSP) F-15 mission.

Jimi Anzelc	Cynthia Hampton
Todd Brooks	Mark Healy
Brenda Cumbie	Janis Smyly
Robert Finson	Marshall Smyly

NODC, Data Operations Branch – For recovering missing metadata critical to documenting early National Oceanographic Data Center archived data.

Keith Levinson
Francis Mitchell

ORA Group – For enabling early access to improved data for climate and weather applications by augmenting the post-launch checkout of the NOAA-17 sensors.

Changyong Cao
Lawrence Flynn
Thomas Kleespies
Tsan Mo
Jerry T. Sullivan
Michael Weinreb

Organizational Bronze Award

NESDIS SFA Facilitators – For successfully conducting work group meetings as part of NOAA's 2002 Survey Feedback Action process.

Katherine Fincher	Curtis Holland
Terry Babb	Don Nortrup
Barbara Brooks	Annie Reiser
Alfreda Carter	George Sharman
Carmella Davis-Watkins	Lisa Taylor

Organizational Bronze Award submitted by NWS

For rapid and innovative actions in collecting, archiving, and analyzing weather radar data to assist the Shuttle Columbia accident investigation. The following organizations were recognized for this award:

Radar Operations Center
Space Flight Meteorology Group
Southern Region Headquarters
National Severe Storms Laboratory
National Climatic Data Center
Warning Decision Training Branch



NOAA 2003 Distinguished Career Awards

Steven P. Kirkner – For leadership and exceptional skill in successfully acquiring and launching earth observing satellites for NOAA and NASA.

August L. Shumbera, Jr. – For 26 years of outstanding continuous performance in establishing and enhancing the stewardship of NOAA's environmental data and information.

NOAA "Best of the Best" Health and Safety and Environmental Compliance Award

Joanne Magoulas – For establishing the Environmental, Safety, and Health (ESH) Working Group for the NPOESS Integrated Program Office.

NOAA October Team Member of the Month

Lauraleen O'Connor – For excellent work and dedication on our satellite based environmental observation requirements.

NOAA May Employee of the Month

Janice Sessing – For key contributions in budget outreach and communications, critical to disseminating the NESDIS message, clarifying issues and requirements, and providing timely information to interested parties, particularly Congress.

ANTONIO A. ABADIA EVERETT A. ABBOTT DIANA L. ABNEY STANLEY J. ABNEY MARY ADAMS ANDREW L. ADKINS, JR. CAROLYN W. ALDERMAN ANDREW J. ALLEGRA DONALD L. ALLEN PAUL C. ALLEN KEITH AMBURGEY DAWN W. ANDERS DAVID M. ANDERSON DONNA M. ANDERSON DOROTHY L. ANDERSON GLORIA E. ANDERSON WILLIAM E. ANGEL JIMI R. ANZELC CHARLENE J. APPERSON JEFFREY D. ARNFELD JOSEPH C. ASKEW STEVEN M. ATKINS ROBERT M. AUNE LYNNE P. AXTELL TERRY V. BABB SHYAM N. BAJPAI CLIFFORD B. BAKER EDWARD M. BAKER RICHARD T. BALDWIN THOMAS BALDWIN ANNE O. BALL JAMES G. BALLOU BARBARA A. BANKS WALID J. BANNOURA RICHARD M. BARAZOTTO CHRISTOPHER D. BARNET ALVA J. BARNETTE CELSO S. BARRIENTOS RICHARD BARTH ROBERT M. BASSETT JOHN J. BATES BRUCE BAUER ERIC J. BAYLER JOHN H. BEALL RUSSELL H. BEARD JANICE A. BEATTIE THOMAS W. BECKER PHYLLIS BELLAMY TONI D. BELLAMY PATRICK S. BELOTE EDWARD T. BELOTE, JR. DAVID A. BENNER DELMAL L. BENNETT JAMES L. BERGER EUGENE J. BERRY PAULA E. BERRY HARRIETT A. BLEVINS BRIAN G. BLOEDEL HAL J. 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DMSP F-16 lifts off from
Vandenberg Air Force Base,
California, aboard a Titan II.
Credit: Patrick H. Corkery,
Lockheed Martin Space Systems

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